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Authors

Warraich, Haider J
Kaltenbach, Lisa A
Fonarow, Gregg C
et al.

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Adverse Change in Employment Status After Acute Myocardial Infarction: Analysis From The TRANSLATE-ACS Study

Haider J Warraich, MD[1,2,*], **Lisa A Kaltenbach, MS**[2], **Gregg C Fonarow, MD**[3], **Eric D Peterson, MD, MPH**[1,2], and **Tracy Y Wang, MD, MHS, MSc**[1,2]

[1]Department of Medicine, Division of Cardiology, Duke University Medical Center, Durham NC

[2]Duke Clinical Research Institute, Durham NC

[3]Department of Medicine, Cardiology Division, University of California Los Angeles, Los Angeles CA

Abstract

Background—Inability to resume employment after acute myocardial infarction (MI) has important implications for patients. We sought to assess the prevalence of and outcomes associated with adverse change in employment after MI in a national US cohort.

Methods and Results—The TRANSLATE-ACS study assessed employment status at baseline and 1 year among 9,319 MI patients (mean age 60.8 years, standard deviation [SD] 11.3; 27.3% female) enrolled at 233 US hospitals. We defined adverse change in employment as patients working at baseline but working less or not working at 1 year post-MI. In multivariable models, we assessed factors associated with adverse change in employment and its association with patient-reported depression, health status, persistence to evidence-based medications prescribed at discharge and financial hardship affording medications. Half of patients (51%, n=4,730) were employed at the time of MI. By 1 year, 10% (n=492) of these reported an adverse change in employment, with 3% (n=143) working less and 7% (n=349) no longer working (only 27 of 349 reported retirement). Factors significantly associated with adverse change in employment included number of unplanned readmissions, post-discharge bleeding complications, hypertension, and smoking. At 1 year, patients with an adverse change in employment were more likely to report depression (Patient Health Questionnaire-2 score >3: 27.4% vs. 16.7%), lower health status (mean EuroQoL visual analogue scale: 73 [SD 17.8] vs. 78 [SD 14.8]) and moderate-extreme financial hardship with medication costs (41.0% vs. 28.4%) (all p<0.001). There was no difference in persistence to evidence-based medications prescribed at discharge.

Conclusions—Patients who experienced an adverse change in employment after MI reported lower quality of life, increased depression and more difficulty affording medications. These results

*Correspondence: Haider Javed Warraich, MD, 2301 Erwin Road, DUMC 3485, Durham NC 27710 Telephone: 919-668-0950 Fax: 919-681-9842 haider.warraich@duke.edu.

underscore the need for interventions to address this patient-centered outcome and its health impact.

Clinical Trial Registration—ClinicalTrials.gov; Unique Identifier: NCT01088503

Keywords

acute myocardial infarction; job Loss; depression; quality of life; medication adherence; financial hardship

Cardiovascular disease is the leading cause of morbidity and mortality in the United States[1] and acute myocardial infarction (MI) accounts for a significant proportion of the disease burden of cardiovascular disease. Advances in prevention and treatment strategies have led to significant improvement in clinical outcomes and age-adjusted mortality from MI.[2] It remains unclear, though, if similar progress has been achieved in outcomes that are particularly patient-centric, such as the ability to maintain or return to employment.

Social determinants of health are strongly linked to the risk of human disease, with employment, or the lack thereof, being one of the most significant. [3] The risk of MI increases linearly with each cumulative job loss.[3] Single center studies performed in the early percutaneous coronary intervention (PCI) era have shown that more than a third of MI patients are unable to return to work by 1 year.[4, 5] Job loss significantly interacts with other psychosocial factors such as depression and health status; for example, depression can be both a cause and a consequence of an adverse change in employment.[6] Employment status may also influence medication-taking behavior and affordability.[7] However, the prevalence of adverse change in employment after MI, as well as the association between post-MI job changes and psychosocial outcomes and medication-taking behavior, have not been well investigated in a large representative US cohort.

Using data from the Treatment with Adenosine Diphosphate Receptor Inhibitors: Longitudinal Assessment of Treatment Patterns and Events after Acute Coronary Syndrome (TRANSLATE-ACS) registry[8], we assessed the prevalence of adverse change in employment between baseline and 1 year post-MI in a national US cohort. We compared patient-reported depression, quality of life, medication adherence, and financial hardship affording medications between patients who experienced an adverse change in employment and those who remained working at 1 year without an adverse change.

Methods

Study Population

TRANSLATE-ACS (http://clinicaltrials.gov: NCT01088503) is a longitudinal, observational registry of patients treated for acute MI at 233 US hospitals between April 2010 and October 2012. Details of the design and conduct of the TRANSLATE-ACS study have been previously published.[8] Patients were included in the registry if they were 18 years of age presenting with STEMI or NSTEMI, treated with percutaneous coronary intervention (PCI) and a P2Y12 inhibitor, were not enrolled in another research study, and were able to provide written consent for longitudinal telephonic follow-up and data collection. Study enrollment

received institutional review board approval at each participating hospital. Of the total 12,365 patients enrolled in 233 US hospitals, we excluded patients who died in-hospital (n=14), did not have baseline (n=98) and 1 year employment status recorded (n=2,934), resulting in a final study population of 9,319 patients for this analysis.

Data Collection and Definitions

Detailed demographic, clinical, and angiographic characteristics, in-hospital laboratory values, and adverse outcomes (as shown in Table 1) were collected for all patients using a standardized set of data elements and definitions in accordance with those used by the National Cardiovascular Data Registry CathPCI Registry.[9] Centralized telephone follow-up was conducted by trained Duke Clinical Research Institute personnel for all enrolled patients at 6 weeks, and 6, 12 and 15 months after discharge. At each interview, standardized questionnaires collected interval medication changes and patient-reported outcomes using validated instruments, as described in the Outcomes section below. [10, 11]

Patients were asked about their work status at the 1-year interview. Those who reported working "full-time" or "part-time" were defined as working. We defined an "adverse change in employment" as patients who reported working immediately before the index MI hospitalization, but were either no longer working or working less hours 1 year later. Patients no longer working at 1 year included those who reporting being laid off, disabled, on sick leave, retired or unemployed for other or non-specified reasons.

Hospital bills were collected for all subsequent hospital visits involving at least one overnight stay, including inpatient or observation status admission.[12] Medical records were collected to permit independent physician adjudication of recurrent MI, coronary revascularization procedures, stroke, and bleeding events occurring within 1 year post-MI. Unplanned readmissions were defined as any bill-confirmed hospital visit involving at least 1 overnight stay except for hospitalizations involving an adjudicated, planned coronary revascularization within 60 days of the index PCI.

Outcomes

Outcomes of interest included depression, self-rated health status, evidence based medication (EBM) persistence[13], patient-reported medication adherence[14], and financial hardship associated with medication costs[12]. Depression and self-rated health status at baseline, 6 weeks, 6 months and 1 year post-MI were compared between patients with and without adverse change in employment. Depression was defined as a Patient Health Questionnaire score-2 score >3[15], and health status was measured using the EuroQoL-5 Dimensions (EQ5D) visual analog scale [11]. As previously described, "persistence" was defined as percentage of patients still taking the EBMs prescribed at discharge at the 1-year interview.[13] These EBMs included aspirin, P2Y12 inhibitors, statins, beta blockers, and angiotensin-converting enzyme inhibitors/angiotensin-receptor blockers (ACE/ARB). Consistent with prior work, patient-reported medication adherence was a summed score based on 3 questions asked during the 1 year interview[14]; the score ranged from 0 to 3 where 0 indicates optimal adherence: 1) Do you sometimes forget heart medications? Yes = 1, No = 0; 2) How often do you have difficulty remembering to take all your heart medications?

Never = 0, all other answers = 1; 3) Do you know what to do if you run out of medication? Yes = 0, No =1. Patients were asked to rank on a scale of 1 to 5 the financial hardship of their monthly medication cost (1=no hardship, 2=minimal hardship, 3=moderate hardship, 4=much hardship, 5=extreme hardship). Financial hardship was defined as a score >2.

Statistical Analysis

We compared patient characteristics between patients working at baseline and not working at baseline, and then among those working at baseline, those with and without an adverse change in employment by 1 year. Categorical variables were presented as frequencies (percentages) and differences between the groups were assessed using the Chi-Square test. Continuous variables are presented as mean with standard deviation (SD) and were compared using the Wilcoxon rank-sum test. Changes in depression and EQ5D VAS over time were compared among patients who experienced adverse change in employment, patients who retained employment, and patients who were not employed or retired at baseline. We calculated p trends for changes in EQ5D VAS and PHQ2 >3 over time from baseline to 6 months to 1 year post-MI.

We used logistic regression to assess factors associated with adverse change in employment status at 1 year post-discharge. The variable list, adapted from prior research based on clinical judgment [4, 16–18] included the following variables: Age, sex, race, Hispanic ethnicity, insurance status, education level, marital status, diabetes, hypertension, smoking, body mass index, prior MI, prior PCI, prior coronary artery bypass graft surgery, prior stroke/transient ischemic attack, peripheral arterial disease, atrial fibrillation/flutter, chronic lung disease, STEMI, multivessel disease, multivessel PCI, creatinine clearance, ejection fraction 40%, length of index stay, presentation or in-hospital development of heart failure signs/symptoms, cardiac arrest, cardiogenic shock, baseline PHQ2>3, baseline EQ5D VAS, post-discharge events within 1 year (recurrent MI, unplanned revascularization, stroke, Bleeding Academic Research Consortium [BARC] 2+ bleeding), and number of all-cause unplanned rehospitalizations. We used generalized estimating equations with exchangeable correlation structure to account for within-hospital clustering. We calculated a C-index to assess how well this model discriminated between patients with and without an adverse change in employment.

We used a similar methodology to assess the association of adverse change in employment with 1-year depression, EBM persistence, medication adherence, and financial hardship affording medications. Each model adjusted for the following variables: age, sex, race, body mass index, STEMI, prior MI, diabetes, hypertension, smoker, number of unplanned rehospitalizations in first year, BARC 2+ bleeding in first year, number of meds reported at 1 year (of aspirin, P2Y12 inhibitor, statin, beta-blocker, ACE/ARB), baseline EQ5D VAS, and baseline PHQ2. Adjusting for these same variables, we assessed the association of adverse change in employment with 1-year EQ5D VAS using linear regression with GEE.

Variables inputted into the model were missing <5%. To account for missing data, categorical variables were imputed to the mode, creatinine clearance, and ejection fraction were imputed using medians and body mass index was imputed using gender and STEMI vs. NSTEMI specific medians. We did not impute clinical outcomes. In all instances, p<0.05

was considered statistically significant. All analyses were performed with SAS version 9.2 (Cary, NC).

Results

In the final study population of 9,319 patients, the mean age was 55.8 years (SD 9.2) and 27.3% were female; more than half (n=4,730, 51%) were working at the time of their index MI. (Figure 1) Patients not working at baseline were more likely to be older, black, female, unmarried and not have graduated high school. (Table 1) They were more likely to have medical comorbidities than patients who were working. Most patients not working at baseline were retired (n=3355, 73%). Patients working at baseline were more likely to smoke and to present with STEMI or have a cardiac arrest during the index MI hospitalization.

Changes in Work Status

Among patients working at baseline, 10% (n=492) reported an adverse change in employment 1 year later, with 7% (n=349) no longer working while 3% (n=143) reported working less. (Figure 1) Only 27 of those with an adverse change in employment reported retirement; 172 patients (49% of patients no longer working) reported involuntary job loss such as being laid off or no longer working due to their health and disability.

Patients who experienced an adverse change in employment post-MI were more likely to be female, have diabetes, hypertension, tobacco use and were less likely to have a drug eluting stent placed than patients who continued working as before. (Table 2) Patients with an adverse change in employment were more likely to have recurrent MI, unplanned revascularization, stroke and BARC2+ bleeding than patients who were still working. (Table 2)

In multivariable analysis, the strongest factor associated with adverse change in employment in the 1 year after discharge was the number of readmissions within the first year (OR 1.20, 95% CI 1.09–1.32 per event). Other factors significantly associated with adverse change in employment include baseline smoking status, hypertension, and post-discharge bleeding (Table 3). Notably, factors, such as sex, baseline health status, and recurrent MI were significant in unadjusted comparisons, but did not remain significantly associated with adverse change in employment in the multivariable model.

Outcomes

Patients experiencing an adverse change in employment were more likely to have depression at baseline compared with those experiencing no change (6.5% vs. 4.5%, p=0.04); these differences widened at 6 weeks (22.4% vs. 19.2%, p=0.1), 6 months (23.6% vs. 16.4%, p<0.001) and 1 year (27.4% vs. 16.7%, p<0.001, Figure 2A) in part due to observed improvement among patients who resumed work. The difference in depression over time was significant between patients who experienced an adverse change in employment and those who resumed work: p<0.001. Patients not working at baseline, not retired and who did not resume working at 1 year had significantly higher rates of depression throughout study period. Patients with an adverse change in employment also had lower self-rated health

status (EQ5D VAS) than those not experiencing any adverse change (70.7 [SD 19.7] vs. 73.5 [17.5] at baseline, 74.1 [SD 16.2] vs. 76.7 [SD 15.3] at 6 weeks, 75.4 [SD 15.8] vs. 78.2 [SD 15.0] at 6 months, 73.0 [SD 17.8] vs. 78.4 [SD 14.8] at 1 year, all p 0.01, Figure 2B). Patients not working at baseline, not retired and who did not resume working at 1 year had significantly poorer EQ5D VAS scores throughout the study period. Change in EQ5D VAS score over time was significant only for patients working at baseline with no adverse change within the next year (p<0.001); these patients experienced improvement in quality of life over time.

At 1 year, patients with adverse changes in employment were more likely to have PHQ2 score>3 suggestive of depression and lower EQ5D VAS scores suggestive of lower quality of life in both unadjusted and adjusted comparisons (Table 4). No difference was noted in patient-reported medication adherence or in persistence of EBMs prescribed at discharge. However, more patients who had adverse change in employment reported moderate-extreme financial hardship with out of pocket medication costs than those without change in work status after adjustment for clinical and sociodemographic characteristics (Table 4).

Discussion

This study sheds novel insights into patients' ability to return to work after MI. We found that 1 in 10 patients working at baseline had an adverse change in employment at 1 year; 7% were unable to return to work and 3% worked less. Almost half of job losses were described by the patient as involuntary. An adverse change in employment was associated with increased risk of depression, lower self-rated health status and increased financial hardship associated with affording medications. These findings have important implications for patient-centered care for MI patients.

A key finding of this analysis is the very low rate of adverse change in employment after MI. Improvements in treatments for MI, in addition to causing dramatic reductions in total and age-adjusted mortality after MI, have also resulted in significant improvements in patient functionality after MI. We hypothesize that advances in MI care have also resulted in improvement in patients' ability to resume employment. In comparison with prior literature, we now observe a substantially lower rate of job loss within 1 year after MI.[4, 5, 16–22] In fact, our study demonstrates the lowest rate of adverse change in employment at 1 year amongst MI patients to date (Figure 3). These findings thus represent commendable translation of clinical outcomes into patient-centered measures, representing additional crucial protection for patients from the financial hardship associated with medical care. However, this progress must not deter efforts to target patients who are at high risk for job loss with psychosocial and occupational interventions during the initial episode of care for MI. In our study, factors that were associated with the greatest chance of work loss were unplanned hospitalizations, bleeding, hypertension and smoking status. Finally, similar to prior studies, we demonstrate that patients unemployed at baseline are at risk for poorer outcomes after MI.[3]

Depression occurs commonly after MI and our data suggests that an adverse change in employment is associated with higher rates of depression. Rates of depression increase after MI for all patient groups, however, patients able to resume work actually demonstrate a

reduction in rates of depression while those who are unable to resume work see a continuously rising trend in prevalence of depression. Rates of depression in patients unable to resume work begin to approach those who are unemployed and not retired at baseline by 1 year.[3] Furthermore, patients with depression remain at high risk for losing employment even after they return to work. In a recently published nationwide study from Denmark analyzing factors associated with inability to maintain work after despite resumption of work within a 1 year post-MI, depression was the strongest predictor of subsequent detachment from work.[22] In our analysis, however, while depression was slightly higher at baseline amongst patients who experienced adverse change in employment (6.5% vs. 4.5%, p=0.04), depression was not a significant predictor of adverse change in our adjusted model.

Patients who experience an adverse change in employment also experience poorer quality of life. Self-rated health, in addition to reflecting a poor sense of physical and emotional well being, is also a sensitive marker of adverse clinical outcomes, and is associated with increased mortality.[23] While self-rated health improved steadily for patients who resumed work (p trend <0.001), it did not do so for patients unemployed at baseline or who were unable to resume work (p trend non-significant). These outcomes become increasingly important given their importance to patients and improvements in clinical outcomes such as mortality.

These associations underscore the importance of this patient-centered outcome and raise several questions. Can we predict or prevent adverse changes in employment? Our data suggests that the factor most strongly associated with job loss was unplanned readmissions. Prevention of post-MI readmission has been the focus of national quality improvement initiatives in recent years.[24] Patients who experienced a bleeding complication also had a higher likelihood of experiencing adverse change in employment. Risk scores to identify patients at high risk of bleeding have been proposed to assist in antiplatelet medication selection and long-term management.[25, 26] Treating depression in patients post-MI has been known to lower depression and improve quality of life, but not cardiovascular outcomes, it remains unknown if behavioral or pharmacotherapeutic interventions result in an improved ability to return to work.[27]

Unemployment is known to reduce medication adherence,[28] another important factor affecting outcomes in patients after MI.[29] In our study, we examined medication-taking in 2 ways: persistence assesses both clinician and patient continuation of evidence-based medications, whereas adherence describes the patient's medication-taking behavior. While adverse change in employment did not result in a significant difference in medication persistence or adherence in our study, we did find increased financial hardship reported amongst those whose work status was adversely affected. Financial hardship associated with medications has been shown in prior studies to lead to reduced long-term adherence and worse medical outcomes amongst post-MI patients.[30]

Our study has several limitations. The precise timing of work loss/reduction could not be analyzed. Unmeasured factors may contribute to adverse change in employment. Medication adherence was patient self-reported based on a questionnaire, and may be overestimated. While financial hardship was assessed, specific impact of adverse change in employment on

household income could not be examined as ~43% of patients declined to provide information about income level. Income levels are poorly reported in many observational studies and can be weighted towards both patients with high or low socioeconomic status.[31] Given the observational nature of this study, we cannot make inferences regarding causality when examining outcomes. Lastly, we included patients who retired (n=27) into those experiencing as adverse change in employment given that health shocks such as MI are associated with early retirement decisions.[32, 33]

In conclusion, our study shows that the lowest levels of job loss in the context of prior studies of MI patients. However, almost half of job losses were involuntary. Patients who experience an adverse change in employment are at increased risk of depression, lower quality of life, and increased financial hardship with medication costs compared to those who continue working. Unplanned rehospitalizations and post-MI bleeding are the strongest predictors of adverse change in employment, increasing the impetus to reduce the incidence of these adverse outcomes. These results underscore the need for interventions to address this patient-centered outcome and its health impact.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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What Is Known

- Clinical outcomes of acute myocardial infarction have experienced sustained improvement over the past several decades.

- Acute myocardial infarction, historically, has had a profoundly adverse experience on patients' ability to resume full employment.

What This Study Adds

- In a more contemporary national US population, adverse change in employment only affects one in ten patients after acute myocardial infarction.

- Bleeding after cardiac catheterization and unplanned rehospitalization are the factors most strongly associated with adverse change in employment after acute myocardial infarction.

- Patients who experience adverse change in employment have worse health status, depression and hardship affording medications than patients who do not experience adverse change in employment.
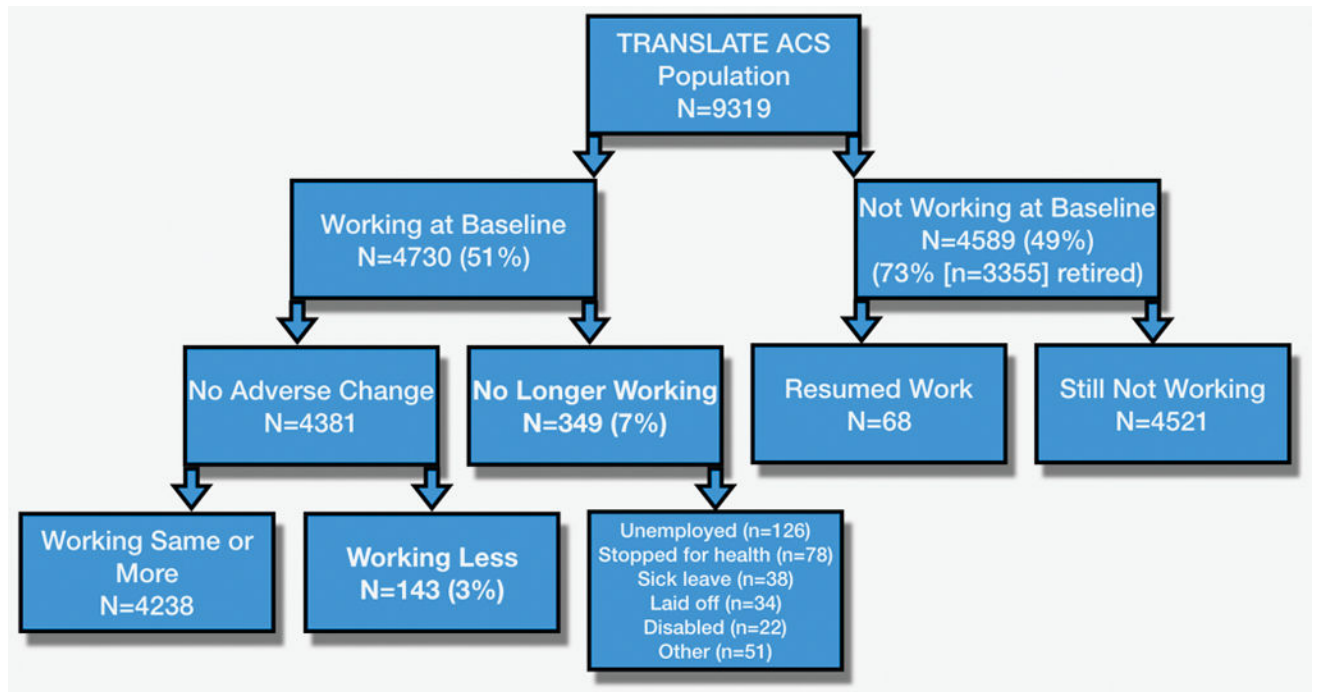
Figure 1.
Distribution of Patients by Baseline Employment Status and Change After MI.
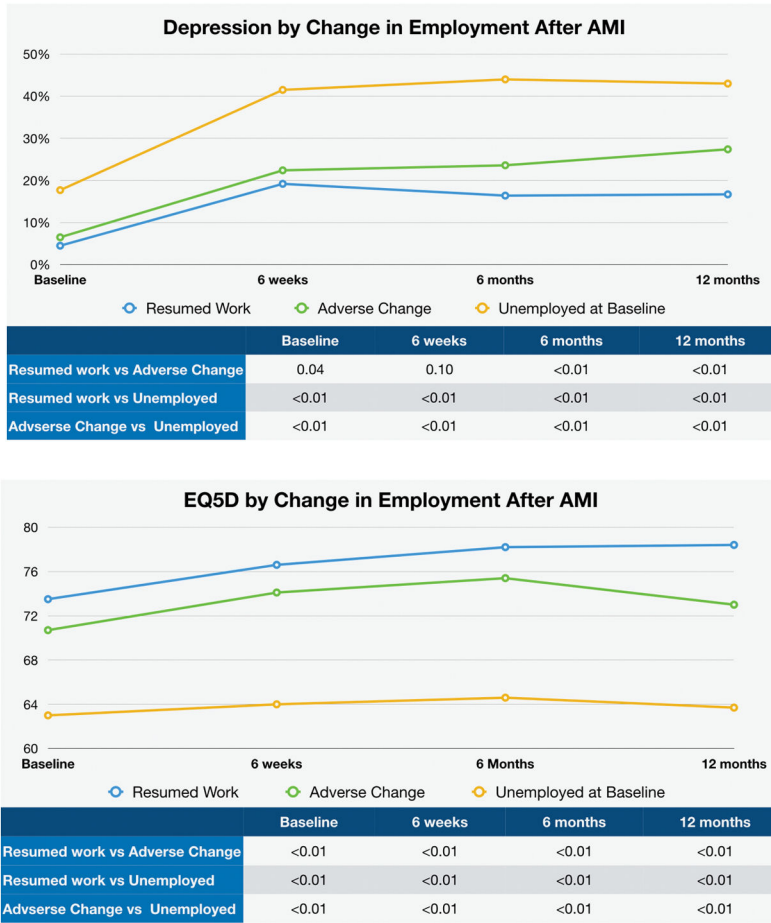
Figure 2.
Change in (A) depression (PHQ2>3) and (B) self-rated health status (EQ5D VAS) after MI amongst patients by employment status change. P values show significance of differences in PHQ2>3 amongst patient groups at baseline and followup.

Prevalence of Job Loss 1 Year after AMI

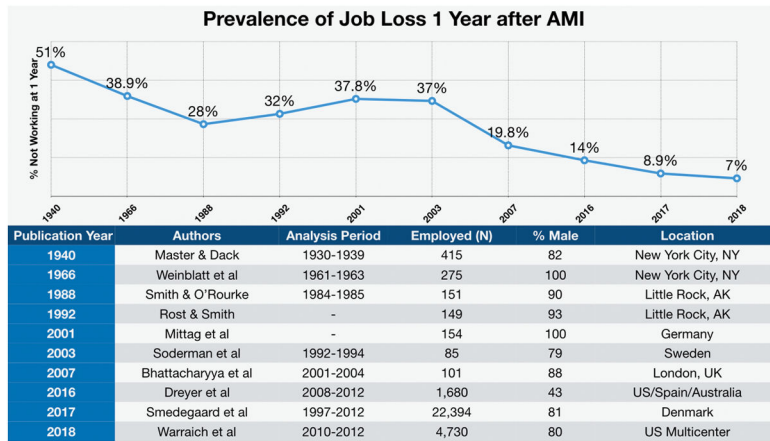| Publication Year	Authors	Analysis Period	Employed (N)	% Male	Location
1940	Master & Dack	1930-1939	415	82	New York City, NY
1966	Weinblatt et al	1961-1963	275	100	New York City, NY
1988	Smith & O'Rourke	1984-1985	151	90	Little Rock, AK
1992	Rost & Smith	-	149	93	Little Rock, AK
2001	Mittag et al	-	154	100	Germany
2003	Soderman et al	1992-1994	85	79	Sweden
2007	Bhattacharyya et al	2001-2004	101	88	London, UK
2016	Dreyer et al	2008-2012	1,680	43	US/Spain/Australia
2017	Smedegaard et al	1997-2012	22,394	81	Denmark
2018	Warraich et al	2010-2012	4,730	80	US Multicenter

Figure 3.

Prevalence of job loss at 1 year after MI. Authors review of historical literature that reported prevalence of job loss at 12 months after acute MI.[4, 5, 16–22]

Table 1

Differences in Characteristics and Outcomes Between Patients Working and Not Working at Baseline

	Not Working (n=4589)	Working (n=4730)	P value
Demographics			
Age, mean (years)	65.9 (11.0)	55.8 (9.2)	<0.001
Male gender	65.0 (2,984)	80.3 (3796)	<0.001
White race	87.5 (4013)	90.3 (4269)	<0.001
Black race	9.7 (446)	6.5 (308)	<0.001
Hispanic race	3.0 (139)	3.3 (156)	0.46
Uninsured	12.3 (566)	13.7 (647)	0.063
High School or beyond	84.2 (3862)	93.0 (4397)	<0.001
Married	60.9 (2795)	70.3 (3327)	<0.001
Clinical Characteristics			
Prior MI	23.9 (1095)	14.5 (684)	<0.001
Prior PCI	26.4 (1211)	16.0 (757)	<0.001
Prior CABG	13.5 (618)	4.9 (233)	<0.001
Prior CVA/TIA	8.0 (369)	2.5 (118)	<0.001
Peripheral artery disease	9.1 (417)	2.8 (130)	<0.001
Prior heart failure	8.1 (372)	1.9 (89)	<0.001
AFIB/flutter	7.0 (322)	2.3 (107)	<0.001
Diabetes	30.4 (1394)	19.9 (942)	<0.001
Hypertension	74.7 (3428)	58.7 (2777)	<0.001
Chronic lung disease	13.3 (610)	4.7 (222)	<0.001
Current/recent smoker	31.9 (1462)	38.7 (1828)	<0.001
In-hospital Characteristics			
ST-Elevation MI	46.9 (2151)	57.2 (2705)	<0.001
Cardiac arrest during admission	2.6 (120)	3.8 (178)	0.002
Cardiogenic shock during admission	1. 8 (83)	2.1 (101)	0.287
Multivessel disease	53.7 (2463)	44.9 (2125)	<0.001
Body mass index, mean	29.9 (6.7)	30.5 (6.2)	<0.001
Creatinine clearance, mean	65.8 (28.7)	82.47 (24.6)	<0.001
Ejection Fraction, mean	50.5 (11.3)	51.4 (10.8)	<0.001
Length of stay, mean	3.2 (2.3)	2.9 (1.8)	<0.001
1-Year Post-Discharge Course			
Recurrent MI	5.5 (252)	2.5 (120)	<0.001
Unplanned Revascularization	10.9 (502)	8.5 (401)	<0.001
Stroke	1.0 (44)	0.3 (15)	<0.001
BARC 2+ bleed	22.8 (1046)	18.3 (865)	<0.001
# of All-cause unplanned hospitalizations, mean	0.0 (1.2)	0.4 (0.8)	<0.001

Values presented as %(n) or mean (standard deviation) where indicated. Abbreviations: *AFIB – atrial fibrillation, CABG – coronary artery bypass grafting, CVA – cerebrovascular accident, MI – myocardial infarction, PCI – percutaneous coronary intervention, PHQ - patient health questionnaire, TIA – transient ischemic attack*

Table 2

Differences in Characteristics and Outcomes Between Patients With or Without Adverse Change in Employment within 1 Year post-discharge.

	No Adverse Change (n=4238)	Adverse Change (n=492)	P Value
Demographics			
Age, mean (years)	55.8 (9.3)	56.05.7 (8.7)	0.940
Male gender	80.9 (3427)	75.0 (369)	0.002
White race	90.4 (3832)	88.8 (437)	0.189
Black race	6.4 (269)	7.9 (39)	0.183
Hispanic race	3.3 (141)	3.1 (15)	0.735
Uninsured	13.5 (571)	15.5 (76)	0.258
High School or beyond	92.3 (3935)	93.9 (462)	0.870
Married	70.8 (2999)	66.7 (328)	0.057
Clinical Characteristics			
Prior MI	14.4 (608)	15.5 (76)	0.511
Prior PCI	15.9 (672)	17.3 (85)	0.416
Prior CABG	4.9 (206)	5.5 (27)	0.543
Prior CVA/TIA	2.4 (103)	3.1 (15)	0.402
Peripheral artery disease	2.7 (113)	3.5 (17)	0.311
Prior heart failure	1.8 (76)	2.6 (13)	0.190
AFIB/flutter	2.3 (99)	1.6 (8)	0.318
Diabetes	19.4 (823)	24.2 (119)	0.012
Hypertension	57.8 (2451)	66.3 (326)	0.0003
Chronic lung disease	4.7 (200)	4.5 (22)	0.806
Current/recent smoker	38.1 (1615)	43.3 (213)	0.025
In-Hospital Characteristics			
ST-Elevation MI	57.0 (2417)	58.5 (288)	0.523
Cardiac arrest on admission	3.8 (162)	3.3 (16)	0.510
Cardiogenic shock	2.2 (92)	1.8 (9)	0.604
Multivessel disease	44.8 (1900)	45.7 (225)	0.831
Multivessel PCI	9.8 (414)	9.2 (45)	0.652
Drug eluting stent used	75.1 (3184)	69.9 (344)	0.010
Body mass index, mean	30.4 (6.0)	31.1 (7.1)	0.084
Creatinine clearance, mean	82.6 (24.5)	81.8 (25.8)	0.315
Ejection Fraction, mean	51.4 (10.7)	50.9 (11.5)	0.652
Length of stay, mean (days)	2.9 (1.8)	3.0 (1.7)	0.114
EQ5D VAS Score, mean	73.5 (17.5)	70.7 (19.7)	0.013
PHQ2 >3	4.5 (189)	6.5 (32)	0.042
1-Year Post-Discharge Course			
Recurrent MI w/in 1 year	2.2 (91)	5.9 (29)	<0.001

	No Adverse Change (n=4238)	Adverse Change (n=492)	P Value
Unplanned Revas w/in 1 year	7.9 (333)	13.8 (68)	<0.001
Stroke w/in 1 year	0.3 (11)	0.8 (4)	0.039
BARC 2+ bleed w/in 1 year	17.6 (745)	24.4 (120)	<0.001
# of unplanned hospitalizations, mean	0.4 (0.8)	0.6 (1.1)	<0.001

Values presented as %(n) or mean (standard deviation) where indicated. Abbreviations: *AFIB – atrial fibrillation, CABG – coronary artery bypass grafting, CVA – cerebrovascular accident, MI – myocardial infarction, PCI – percutaneous coronary intervention, PHQ - patient health questionnaire, TIA – transient ischemic attack*

Table 3

Factors associated with adverse change in employment status at 1 year

Parameter	Adjusted		
	OR (95% CI)	Wald Chi-Square Test Statistic	P-value
# of Unplanned Readmissions per 1 increase	1.20 (1.09, 1.32)	13.20	0.0003
BARC 2+ bleed w/in 1 year	1.39 (1.13, 1.72)	9.34	0.0022
Hypertension	1.33 (1.08, 1.65)	7.12	0.0076
Smoker	1.28 (1.04, 1.57)	5.28	0.0215
Recurrent MI w/in 1 year	1.64 (0.99, 2.71)	3.64	0.0563
Female vs. Male	1.23 (0.98, 1.56)	3.15	0.0757
BMI per 5 increase	1.07 (0.99, 1.16)	3.07	0.0798
Baseline EQ5D VAS per 10 unit decrease	1.04 (0.99, 1.10)	2.83	0.0927
Unplanned Revascularization w/in 1 year	1.30 (0.95, 1.79)	2.65	0.1038

Factors with p 0.1 shown. Additional nonsignificant parameters included stroke within 1 year, EF <40%, insurance status, chronic lung disease, atrial fibrillation, STEMI vs. NSTEMI, cardiac arrest, ethnicity, education, creatinine clearance, age, diabetes, marital status, cardiogenic shock, prior CABG, multivessel PCI, prior stroke/transient ischemic attack, any heart failure, peripheral arterial disease, prior MI, multivessel disease, length of stay and prior PCI. Adjusted model c-index = 0.63. Abbreviations: BMI – body mass index, CABG – coronary artery bypass grafting, CI – confidence interval, EF – ejection fraction, OR – odds ratio, PCI – percutaneous coronary intervention, VAS – visual analog scale

Table 4

Outcomes at 1 year.

	Unadjusted			Adjusted
	Adverse employment change (n=492)	No adverse change (n=4238)	P value	HR (95% CI)
PHQ2 depression score >3	27.4%	16.7%	<0.001	1.60 (1.27, 2.02)
EQ5D Visual Analog Scale	73 (17.8)	78 (14.8)	<0.001	−3.23 (−4.73, −1.74)*
Medication adherence	68.0%	70.6%	0.226	1.15 (0.93, 1.41)
Medication persistence				
• P2Y12 inhibitors	86.1%	88.2%	0.185	0.88 (0.68, 1.14)
• Aspirin	95.3%	96.3%	0.239	0.86 (0.53, 1.40)
• Statins	86.1%	88.3%	0.178	0.87 (0.67, 1.13)
• Beta-blockers	86.0%	87.0%	0.565	0.91 (0.70, 1.17)
• ACEi/ARB	78.0	81.4%	0.116	0.80 (0.63, 1.02)
Moderate/extreme financial hardship with medication costs	41.0%	28.4%	<0.001	1.57 (1.33, 1.87)

Continuous variables expressed as mean (standard deviation). Adjusted for age, sex, race, BMI, MI type, prior MI, diabetes, hypertension, smoking, unplanned rehospitalizations in first year, BARC 2+ bleeding in first year, number of medications reported at 1 year, baseline EQ5D VAS, baseline PHQ2. *Linear regression results expressed as estimate (95% CI)

Abbreviations: ACEi – angiotensin converting enzymes inhibitor, ARB – angiotensin receptor blocker, CI – confidence interval, HR – hazard ratio